

What is claimed is:

1. An audio information transforming method applied to a video/audio format in which a screen includes a plurality of objects and each object has video information, position information, and audio information, said method comprising
5 the steps of:

virtual listening point setting of setting a virtual listening point at a position different from a basic listening point that is set as a position at which a listener listens to an audio;

10 relative velocity calculating of calculating a relative velocity between the virtual listening point and the object; and

audio frequency transforming of executing an audio frequency transformation based on the relative velocity to
15 add a Doppler effect to the audio information at the virtual listening point.

2. The audio information transforming method according to Claim 1,

wherein the relative velocity calculating step calculates the relative velocity between the virtual
5 listening point and the object by calculating velocity information of the object based on position information of the object before and after a predetermined time has lapsed.

3. The audio information transforming method according to Claim 1,

wherein the relative velocity calculating step calculates the relative velocity by extracting velocity
5 information of the object and then comparing the position information and the velocity information of the object and position information of the virtual listening point.

4. The audio information transforming method according to Claim 1,

wherein the relative velocity calculating step calculates the relative velocity between the virtual
5 listening point and the object by calculating velocity information of the virtual listening point based on position information of the virtual listening point before and after a predetermined time has lapsed.

5. The audio information transforming method according to Claim 1,

wherein the relative velocity calculating step calculates the relative velocity by extracting velocity
5 information of the virtual listening point and then comparing position information and the velocity information of the virtual listening point and the position information of the object.

6. An audio information transforming method applied to a video/audio format in which each scene that is replayed on a screen has video information and audio information, and the scene has velocity information and direction
5 information based on which a background is moved, said method comprising the steps of:

virtual listening point setting step of setting a virtual listening point at a position different from a basic listening point that is set as a position at which a
10 listener listens to an audio;

relative velocity calculating step of calculating a relative velocity between the virtual listening point and a background based on the velocity information and the direction information of the background; and

15 audio frequency transforming step of transforming an audio frequency based on the relative velocity to add a Doppler effect to the audio information at the virtual listening point.

7. The audio information transforming method according to Claim 1,

wherein, when the audio information including the Doppler effect previously is included in the object, the
5 audio frequency transforming step executes an audio frequency transformation to cancel the Doppler effect

included in the audio information of the object, and
executes the audio frequency transformation based on the
relative velocity to add the Doppler effect to the audio
10 information of the virtual listening point.

8. The audio information transforming method according
to Claim 1,

wherein, in respect to a final image unit, the
audio frequency transforming step is executed by adding the
5 Doppler effect to the audio information at the virtual
listening point by using a formula by which the audio
frequency transformation of the audio information at the
virtual listening point prior to the final image by one
image unit is executed.

9. The audio information transforming method according
to Claim 1 or 6,

wherein the video/audio format includes reduced
scale information of the screen every scene.

10. A video/audio format utilized in the method set
forth in any one of Claims 1 to 9, said format comprising
at least one of:

velocity information of an object, said object is
5 one of objects included on a screen;

velocity information and direction information of a

scene which is replayed on the screen; and

reduced scale information of the screen every scene.

11. An encoder utilized in the method set forth in any one of Claims 1 to 9, said encoder for encoding at least one of:

velocity information of an object, which is one of objects included in a screen;

velocity information and direction information of a scene; and

reduced scale information of the screen every scene.

12. A program product for transforming audio information and for causing a computer to execute the procedures of;

setting a virtual listening point at a position different from a basic listening point that is set as a position at which a listener listens to an audio;

calculating a relative velocity between the virtual listening point and the object; and

executing an audio frequency transformation based on the relative velocity to add a Doppler effect to the audio information at the virtual listening point.

13. The program product according to Claim 12,
wherein the procedure of calculating the relative
velocity includes a procedure of calculating velocity
information of the object based on position information of
5 the object before and after a predetermined time has
lapsed.

14. The program product according to Claim 12,
wherein the procedure of calculating the relative
velocity includes the procedures of:
extracting velocity information of the object; and
5 comparing the position information and the velocity
information of the object and position information of the
virtual listening point.

15. The program product according to Claim 12,
wherein the procedure of calculating the relative
velocity includes a procedure of calculating velocity
information of the virtual listening point based on
5 position information of the virtual listening point before
and after a predetermined time has lapsed.

16. The program product according to Claim 12,
wherein the procedure of calculating the relative
velocity includes the procedures of :
calculating the relative velocity by extracting

5 velocity information of the virtual listening point; and
comparing position information and the velocity
information of the virtual listening point and the position
information of the object.

17. A program product for transforming audio
information and for causing a computer to execute the
procedures of;

setting a virtual listening point at a position
5 different from a basic listening point that is set as a
position at which a listener listens to an audio;

calculating a relative velocity between the virtual
listening point and a background according to a velocity
and a direction based on which the background of a scene is
10 moved; and

executing an audio frequency transformation based
on the relative velocity to add a Doppler effect to the
audio information at the virtual listening point.

18. The program product according to any one of Claims
12 or 17,

wherein, when the object previously includes audio
information having Doppler effect, the procedure of
5 executing an audio frequency transformation includes the
procedures of:

executing an audio frequency transformation to

cancel the Doppler effect included in the audio information of the object; and

10 executing the audio frequency transformation based on the relative velocity to add the Doppler effect to the audio information of the virtual listening point.

19. The audio information transforming program according to any one of Claims 12 or 17,

 wherein, when audio information transformation at a time of final image unit is executed, said program product
5 further comprising a procedure of:

 adding the Doppler effect to the audio information at the virtual listening point by using a formula, said formula for executing the audio frequency transformation of the audio information at the virtual listening point prior
10 to the final image by one image unit.

20. The audio information transforming program according to Claim 12 or 17,

 wherein the video/audio format includes reduced scale information of the screen every scene.

21. An audio information transforming device for a video/audio format in which a screen includes a plurality of objects and each object has video information, position information, and audio information, said device comprising:

5 virtual listening point setting section for setting
a virtual listening point at a position different from a
basic listening point that is set as a position at which a
listener listens to an audio;

 relative velocity calculating section for
10 calculating a relative velocity between the virtual
listening point and the object; and

 an audio frequency transforming section for
executing an audio frequency transformation based on the
relative velocity to add a Doppler effect to the audio
15 information at the virtual listening point.

22. The audio information transforming device according
to Claim 21,

 wherein the relative velocity calculating section
calculates the relative velocity by comparing position
5 information of the virtual listening point and the position
information of the object and the position information of
the virtual listening point and the position information of
the object after a predetermined time has lapsed.

23. The audio information transforming device according
to Claim 21,

 wherein the relative velocity calculating section
calculates the relative velocity by comparing the position
5 information and velocity information of the object and the

position information of the virtual listening point.

24. The audio information transforming device according to Claim 21,

wherein the relative velocity calculating section calculates the relative velocity by comparing the position
5 information of the object and the position information and velocity information of the virtual listening point.

25. An audio information transforming device for a video/audio format in which each scene that is replayed on a screen has video information and audio information, and the scene has velocity information and direction
5 information based on which a background is moved, said device comprising:

a virtual listening point setting section for setting a virtual listening point at a position different from a basic listening point that is set as a position at
10 which a listener listens to an audio;

a relative velocity calculating section for calculating a relative velocity between the virtual listening point and the background based on the velocity information and the direction information of the
15 background; and

an audio frequency transforming section for executing an audio frequency transformation based on the

relative velocity to add a Doppler effect to the audio information at the virtual listening point.

20